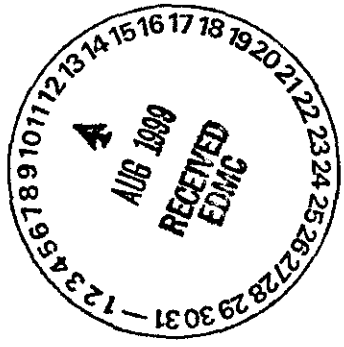
Duncan, Jeanette M

0051491

From: Blumenkranz, David B
Sent: Tuesday, February 16, 1999 4:39 PM
To: Duncan, Jeanette M
Cc: Fancher, Jonathan D (Jon); Sturges, Mark H
Subject: Data Validation Packages



My comments as follows:

Inorganics - Data Package No. W02613-QES: No comments

Radiochemistry - Data Package No. W02613-QES: No comments

Inorganics - Data Package No. W02606-QES: No comments

Radiochemistry - Data Package No. W02606-QES: No comments

Inorganics - Data Package No. H0324-RLN: In "Minor Deficiencies" indicate that the IDL exceeded the TDL for Cr+6 results.

Radiochemistry - Data Package No. H0324-RLN: In "Minor Deficiencies" indicate that the MDA exceeded the TDL for U-238 (GEA) results and U-235 (GEA) in sample B0T6P4. Also, if the lab result is "U" for a particular isotope, isn't the MDA then an estimated best conservative guess concentration? If so, then go ahead and put the MDA in the data summary for Am-241, Co-60, Cs-137, U isotopes (GEA) and the Eu isotopes w/ a footnote to indicate the value in the table is the MDA because a result was not reported.

Semivolatiles - Data Package No. H0324-RLN: In "Minor Deficiencies" indicate that the reported detection limit exceeded the CRDL for B0P6P2, B0P6P3, B0P6P4, B0P6P5 and B0P6P6. Also, we should get the MS & MSD results for bis(2-ethylhexyl)phthalate so the the validator can finish the validation.

PCBs - Data Package No. H0324-RLN: Page numbers 2 & 3 have been transposed. In "Minor Deficiencies" indicate that the IDL exceeded the TDL for Aroclor-1221 results. (Is it spelled Aroclor or Arochlor?)

Thanx,
Dave

Date: 5 February 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 1607-D2
Subject: Semivolatiles - Data Package No. H0324-RLN (SDG No. H0324)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0324-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0T6P1	12/8/98	Soil	C	See note 1
B0T6P2	12/8/98	Soil	C	See note 1
B0T6P3	12/8/98	Soil	C	See note 1
B0T6P4	12/8/98	Soil	C	See note 1
B0T6P5	12/8/98	Soil	C	See note 1
B0T6P6	12/8/98	Soil	C	See note 1

1 - Semivolatiles by EPA 8270B (TCL) {bis(2-ethylhexyl)phthalate}.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

  If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

  Holding times were met for all samples.

- **Blanks**

  Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

  All method blank results were acceptable.

  Equipment Blanks

  One equipment blank (B0T6P1) was submitted for analysis. No analytes were detected in the equipment blank.

- **Accuracy**

  Matrix Spike/Matrix Spike Duplicate Recoveries

  Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within limits established by the laboratory. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

  All matrix spike/matrix spike duplicate results were acceptable.

  Surrogate Recovery

  The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the CRQL are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

  All surrogate recovery results were acceptable.

- **Precision**

  Matrix Spike/Matrix Spike Duplicate Samples

  Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and

the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate results were acceptable.

Field Duplicates

One sample duplicate pair (B0T6P5/B0T6P6) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The laboratory reported detection limit for bis(2-ethylhexyl)phthalate were above the CRDL (no TDLs were available) for samples B0P6P2, B0P6P3, B0P6P4, B0P6P5, and B0P6P6. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data package No. H0324 (SDG No. H0324) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The laboratory reported detection limit for bis(2-ethylhexyl)phthalate were above the CRDL (no TDLs were available) for samples B0P6P2, B0P6P3, B0P6P4, B0P6P5, and B0P6P6. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are continuing calibrations acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A
Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
Were MS/MSD samples analyzed? . . . . . Yes No N/A
Are MS/MSD results acceptable? . . . . . Yes No N/A
Comments: No MS/MSD — J all (received 3/19-)

terphenyl ✓

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . (Yes) No N/A

Are field duplicate RPD values acceptable? . . . . . (Yes) No N/A

Are field split RPD values acceptable? . . . . . Yes No (N/A)

Comments: didn't run ms/msD (received 3/17)

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No (N/A)

Are internal standard areas acceptable? . . . . . Yes No (N/A)

Are internal standard retention times acceptable? . . . . . Yes No (N/A)

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No (N/A)

Is compound quantitation acceptable? . . . . . Yes No (N/A)

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are all results supported in the raw data? . . . . . Yes No (N/A)

Do results meet the CRQLs? . . . . . Yes (No) N/A

Has the laboratory properly identified and coded all TIC? . . . Yes No (N/A)

Comments: all but PJ are CRDL - No TDL

SDG_NUM	SAMP_NU	METHOD_NAM	CON_ID	CON_LONG_NAME	VALUE	LAB_QU	VALIDATION_QUALIF
H0324	B0T6P1	GAMMA_GS	TH-232	Thorium-232	0.17		J
H0324	B0T6P1	GAMMA_GS	13982-63-3	Radium-226	0.15		J
H0324	B0T6P1	GAMMA_GS	14274-82-9	Thorium-228	0.16		J
H0324	B0T6P1	GAMMA_GS	15262-20-1	Radium-228	0.17	J	J
H0324	B0T6P2	GAMMA_GS	TH-232	Thorium-232	0.66		J
H0324	B0T6P2	GAMMA_GS	13982-63-3	Radium-226	0.48		J
H0324	B0T6P2	GAMMA_GS	14274-82-9	Thorium-228	0.79		J
H0324	B0T6P2	GAMMA_GS	15262-20-1	Radium-228	0.66		J
H0324	B0T6P3	GAMMA_GS	TH-232	Thorium-232	0.65		J
H0324	B0T6P3	GAMMA_GS	13982-63-3	Radium-226	0.44		J
H0324	B0T6P3	GAMMA_GS	14274-82-9	Thorium-228	0.7		J
H0324	B0T6P3	GAMMA_GS	15262-20-1	Radium-228	0.65		J
H0324	B0T6P4	GAMMA_GS	TH-232	Thorium-232	0.68		J
H0324	B0T6P4	GAMMA_GS	13982-63-3	Radium-226	0.44		J
H0324	B0T6P4	GAMMA_GS	14274-82-9	Thorium-228	0.59		J
H0324	B0T6P4	GAMMA_GS	15262-20-1	Radium-228	0.68		J
H0324	B0T6P5	GAMMA_GS	TH-232	Thorium-232	0.57		J
H0324	B0T6P5	GAMMA_GS	13982-63-3	Radium-226	0.43		J
H0324	B0T6P5	GAMMA_GS	14274-82-9	Thorium-228	0.59		J
H0324	B0T6P5	GAMMA_GS	15262-20-1	Radium-228	0.57		J
H0324	B0T6P6	GAMMA_GS	TH-232	Thorium-232	0.7		J
H0324	B0T6P6	GAMMA_GS	13982-63-3	Radium-226	0.47		J
H0324	B0T6P6	GAMMA_GS	14274-82-9	Thorium-228	0.64		J
H0324	B0T6P6	GAMMA_GS	15262-20-1	Radium-228	0.7		J

Validation qualifiers added to HEIS

4-12-99

RJW

SDG_NUM	SAMP_NU	METHOD_NAM	CON_ID	CON_LONG_NAME	VALUE_	LAB_QU	VALIDATION_QUALIF
H0324	B0T6P1	8081_PESTPC	11096-82-5	Aroclor-1260	0.1	U	J
H0324	B0T6P1	8081_PESTPC	11097-69-1	Aroclor-1254	0.1	U	J
H0324	B0T6P1	8081_PESTPC	11104-28-2	Aroclor-1221	0.2	U	J
H0324	B0T6P1	8081_PESTPC	11141-16-5	Aroclor-1232	0.1	U	J
H0324	B0T6P1	8081_PESTPC	12672-29-6	Aroclor-1248	0.1	U	J
H0324	B0T6P1	8081_PESTPC	12674-11-2	Aroclor-1016	0.1	U	J
H0324	B0T6P1	8081_PESTPC	53469-21-9	Aroclor-1242	0.1	U	J
H0324	B0T6P2	8081_PESTPC	11096-82-5	Aroclor-1260	35	U	J
H0324	B0T6P2	8081_PESTPC	11097-69-1	Aroclor-1254	35	U	J
H0324	B0T6P2	8081_PESTPC	11104-28-2	Aroclor-1221	70	U	J
H0324	B0T6P2	8081_PESTPC	11141-16-5	Aroclor-1232	35	U	J
H0324	B0T6P2	8081_PESTPC	12672-29-6	Aroclor-1248	35	U	J
H0324	B0T6P2	8081_PESTPC	12674-11-2	Aroclor-1016	35	U	J
H0324	B0T6P2	8081_PESTPC	53469-21-9	Aroclor-1242	35	U	J
H0324	B0T6P3	8081_PESTPC	11096-82-5	Aroclor-1260	35	U	J
H0324	B0T6P3	8081_PESTPC	11097-69-1	Aroclor-1254	35	U	J
H0324	B0T6P3	8081_PESTPC	11104-28-2	Aroclor-1221	71	U	J
H0324	B0T6P3	8081_PESTPC	11141-16-5	Aroclor-1232	35	U	J
H0324	B0T6P3	8081_PESTPC	12672-29-6	Aroclor-1248	35	U	J
H0324	B0T6P3	8081_PESTPC	12674-11-2	Aroclor-1016	35	U	J
H0324	B0T6P3	8081_PESTPC	53469-21-9	Aroclor-1242	35	U	J
H0324	B0T6P4	8081_PESTPC	11096-82-5	Aroclor-1260	36	U	J
H0324	B0T6P4	8081_PESTPC	11097-69-1	Aroclor-1254	36	U	J
H0324	B0T6P4	8081_PESTPC	11104-28-2	Aroclor-1221	71	U	J
H0324	B0T6P4	8081_PESTPC	11141-16-5	Aroclor-1232	36	U	J
H0324	B0T6P4	8081_PESTPC	12672-29-6	Aroclor-1248	36	U	J
H0324	B0T6P4	8081_PESTPC	12674-11-2	Aroclor-1016	36	U	J
H0324	B0T6P4	8081_PESTPC	53469-21-9	Aroclor-1242	36	U	J
H0324	B0T6P5	8081_PESTPC	11096-82-5	Aroclor-1260	35	U	J
H0324	B0T6P5	8081_PESTPC	11097-69-1	Aroclor-1254	35	U	J
H0324	B0T6P5	8081_PESTPC	11104-28-2	Aroclor-1221	71	U	J
H0324	B0T6P5	8081_PESTPC	11141-16-5	Aroclor-1232	35	U	J
H0324	B0T6P5	8081_PESTPC	12672-29-6	Aroclor-1248	35	U	J
H0324	B0T6P5	8081_PESTPC	12674-11-2	Aroclor-1016	35	U	J
H0324	B0T6P5	8081_PESTPC	53469-21-9	Aroclor-1242	35	U	J
H0324	B0T6P6	8081_PESTPC	11096-82-5	Aroclor-1260	36	U	J
H0324	B0T6P6	8081_PESTPC	11097-69-1	Aroclor-1254	36	U	J
H0324	B0T6P6	8081_PESTPC	11104-28-2	Aroclor-1221	72	U	J
H0324	B0T6P6	8081_PESTPC	11141-16-5	Aroclor-1232	36	U	J
H0324	B0T6P6	8081_PESTPC	12672-29-6	Aroclor-1248	36	U	J
H0324	B0T6P6	8081_PESTPC	12674-11-2	Aroclor-1016	36	U	J
H0324	B0T6P6	8081_PESTPC	53469-21-9	Aroclor-1242	36	U	J

Validation qualifiers added to HEAS

4-12-99

RLW

SAMP_NUM	ANAL_MTHD_ID	CON_ID	CON_LONG_NAM	QUALIFI	VALUE_RPT	VALIDATION_QU
B0T6P1	GAMMA_GS	TH-232	Thorium-232		0.17	J
B0T6P2	GAMMA_GS	TH-232	Thorium-232		0.66	J
B0T6P3	GAMMA_GS	TH-232	Thorium-232		0.65	J
B0T6P4	GAMMA_GS	TH-232	Thorium-232		0.68	J
B0T6P5	GAMMA_GS	TH-232	Thorium-232		0.57	J
B0T6P6	GAMMA_GS	TH-232	Thorium-232		0.7	J
B0T6P1	GAMMA_GS	13982-63-3	Radium-226		0.15	J
B0T6P2	GAMMA_GS	13982-63-3	Radium-226		0.48	J
B0T6P3	GAMMA_GS	13982-63-3	Radium-226		0.44	J
B0T6P4	GAMMA_GS	13982-63-3	Radium-226		0.44	J
B0T6P5	GAMMA_GS	13982-63-3	Radium-226		0.43	J
B0T6P6	GAMMA_GS	13982-63-3	Radium-226		0.47	J
B0T6P1	GAMMA_GS	14274-82-9	Thorium-228		0.16	J
B0T6P2	GAMMA_GS	14274-82-9	Thorium-228		0.79	J
B0T6P3	GAMMA_GS	14274-82-9	Thorium-228		0.7	J
B0T6P4	GAMMA_GS	14274-82-9	Thorium-228		0.59	J
B0T6P5	GAMMA_GS	14274-82-9	Thorium-228		0.59	J
B0T6P6	GAMMA_GS	14274-82-9	Thorium-228		0.64	J
B0T6P1	GAMMA_GS	15262-20-1	Radium-228	J	0.17	J
B0T6P2	GAMMA_GS	15262-20-1	Radium-228		0.66	J
B0T6P3	GAMMA_GS	15262-20-1	Radium-228		0.65	J
B0T6P4	GAMMA_GS	15262-20-1	Radium-228		0.68	J
B0T6P5	GAMMA_GS	15262-20-1	Radium-228		0.57	J
B0T6P6	GAMMA_GS	15262-20-1	Radium-228		0.7	J

Validation qualifiers [illegible]

4-12-99

RZW

SAMP_NUM	ANAL_MTHD_ID	CON_ID	CON_LONG_NAM	VALUE_RPT	QUALIFI	VALIDATION_QU
B0T6P1	8081_PESTP	11096-82-5	Aroclor-1260	0.1	U	J
B0T6P2	8081_PESTP	11096-82-5	Aroclor-1260	35	U	J
B0T6P3	8081_PESTP	11096-82-5	Aroclor-1260	35	U	J
B0T6P4	8081_PESTP	11096-82-5	Aroclor-1260	36	U	J
B0T6P5	8081_PESTP	11096-82-5	Aroclor-1260	35	U	J
B0T6P6	8081_PESTP	11096-82-5	Aroclor-1260	36	U	J
B0T6P1	8081_PESTP	11097-69-1	Aroclor-1254	0.1	U	J
B0T6P2	8081_PESTP	11097-69-1	Aroclor-1254	35	U	J
B0T6P3	8081_PESTP	11097-69-1	Aroclor-1254	35	U	J
B0T6P4	8081_PESTP	11097-69-1	Aroclor-1254	36	U	J
B0T6P5	8081_PESTP	11097-69-1	Aroclor-1254	35	U	J
B0T6P6	8081_PESTP	11097-69-1	Aroclor-1254	36	U	J
B0T6P1	8081_PESTP	11104-28-2	Aroclor-1221	0.2	U	J
B0T6P2	8081_PESTP	11104-28-2	Aroclor-1221	70	U	J
B0T6P3	8081_PESTP	11104-28-2	Aroclor-1221	71	U	J
B0T6P4	8081_PESTP	11104-28-2	Aroclor-1221	71	U	J
B0T6P5	8081_PESTP	11104-28-2	Aroclor-1221	71	U	J
B0T6P6	8081_PESTP	11104-28-2	Aroclor-1221	72	U	J
B0T6P1	8081_PESTP	11141-16-5	Aroclor-1232	0.1	U	J
B0T6P2	8081_PESTP	11141-16-5	Aroclor-1232	35	U	J
B0T6P3	8081_PESTP	11141-16-5	Aroclor-1232	35	U	J
B0T6P4	8081_PESTP	11141-16-5	Aroclor-1232	36	U	J
B0T6P5	8081_PESTP	11141-16-5	Aroclor-1232	35	U	J
B0T6P6	8081_PESTP	11141-16-5	Aroclor-1232	36	U	J
B0T6P1	8081_PESTP	12672-29-6	Aroclor-1248	0.1	U	J
B0T6P2	8081_PESTP	12672-29-6	Aroclor-1248	35	U	J
B0T6P3	8081_PESTP	12672-29-6	Aroclor-1248	35	U	J
B0T6P4	8081_PESTP	12672-29-6	Aroclor-1248	36	U	J
B0T6P5	8081_PESTP	12672-29-6	Aroclor-1248	35	U	J
B0T6P6	8081_PESTP	12672-29-6	Aroclor-1248	36	U	J
B0T6P1	8081_PESTP	12674-11-2	Aroclor-1016	0.1	U	J
B0T6P2	8081_PESTP	12674-11-2	Aroclor-1016	35	U	J
B0T6P3	8081_PESTP	12674-11-2	Aroclor-1016	35	U	J
B0T6P4	8081_PESTP	12674-11-2	Aroclor-1016	36	U	J
B0T6P5	8081_PESTP	12674-11-2	Aroclor-1016	35	U	J
B0T6P6	8081_PESTP	12674-11-2	Aroclor-1016	36	U	J
B0T6P1	8081_PESTP	53469-21-9	Aroclor-1242	0.1	U	J
B0T6P2	8081_PESTP	53469-21-9	Aroclor-1242	35	U	J
B0T6P3	8081_PESTP	53469-21-9	Aroclor-1242	35	U	J
B0T6P4	8081_PESTP	53469-21-9	Aroclor-1242	36	U	J
B0T6P5	8081_PESTP	53469-21-9	Aroclor-1242	35	U	J
B0T6P6	8081_PESTP	53469-21-9	Aroclor-1242	36	U	J

Validation qualifiers added to 8290B

4-12-99
RZW

Date: 5 February 1999
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 1607-D2
Subject: Radiochemistry - Data Package No. H0324-TNU (SDG No. H0324)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0324-TNU which was prepared by Thermo NUtec (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0T6P1	12/8/98	Soil	C	See note 1
B0T6P2	12/8/98	Soil	C	See note 1
B0T6P3	12/8/98	Soil	C	See note 1
B0T6P4	12/8/98	Soil	C	See note 1
B0T6P5	12/8/98	Soil	C	See note 1
B0T6P6	12/8/98	Soil	C	See note 1

1 - Gamma spectroscopy; isotopic uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months with liquid scintillation requiring analysis within 7 days of distillation.

  All holding times were acceptable.

- **Blanks**

  Laboratory Blanks

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are elevated to the MDA and qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

  Due to the lack of a blank analysis, all radium-226, radium-228, thorium-228 and thorium-232 results were qualified as estimates and flagged "J".

  All other blank results were acceptable.

  Equipment Blanks

  One equipment blank (B0T6P1) was submitted for analysis. Uranium-233/234, uranium-238, potassium-40, radium-226, radium-228, thorium-222 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

  Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is 70% to 130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to

105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 30 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD of 34%, all thorium-232 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

Two pair of field duplicate samples (samples B0T0B5/B0T0B6 and B0T0F7/B0T0F8) were submitted to QES for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the contract specified MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes and samples had reported MDAs above the TDL/MDA: Uranium-238 (GEA) in all samples and uranium-235 (GEA) in sample B0T6P4. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

- **Completeness**

  Data Package No. H0324 (SDG No. H0324) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a blank analysis, all radium-226, radium-228, thorium-228 and thorium-232 results were qualified as estimates and flagged "J". Due to an RPD of 34%, all thorium-232 results were qualified as estimates and flagged "J". The following analytes and samples had reported MDAs above the TDL/MDA: Uranium-238 (GEA) in all samples and uranium-235 (GEA) in sample B0T6P4. Under the BHI statement of work, no qualification is required. Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0324	REVIEWER: TLI	DATE: 2/5/99	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-232	J	All	RPD
Radium-226, radium-228, thorium-228, thorium-232	J	All	No blank analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																			
Laboratory: TNU																			
Case	SDG: H0324																		
Sample Number		B0T6P1		B0T6P2		B0T6P3		B0T6P4		B0T6P5		B0T6P6							
Location				A5		A6		A7		A8		A8							
Remarks		Equip. Blank										Duplicate							
Sample Date		12/08/98		12/08/98		12/08/98		12/08/98		12/08/98		12/08/98							
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Uranium-233/234	1	0.21		0.49		0.51		0.41		0.53		0.33							
Uranium-235	1	0.013	U	0.023	U	0.016	U	0.008	U	0.051	U	0	U						
Uranium-238	1	0.19		0.44		0.44		0.32		0.45		0.36							
Potassium 40	N/A	4.2		11		10		11		11		11							
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U						
Cesium 137	0.1	U	U	U	U	U	U	U	U	U	U	U	U						
Europium 152	0.1	U	U	U	U	U	U	U	U	0.037		U	U						
Europium 154	0.1	U	U	U	U	U	U	U	U	U	U	U	U						
Europium 155	0.1	U	U	U	U	U	U	U	U	U	U	U	U						
Radium 226	0.1	0.15	J	0.48	J	0.44	J	0.44	J	0.43	J	0.47	J						
Radium 228	0.2	0.17	J	0.66	J	0.65	J	0.68	J	0.57	J	0.7	J						
Thorium 228	N/A	0.16	J	0.79	J	0.7	J	0.59	J	0.59	J	0.64	J						
Thorium 232	N/A	0.17	J	0.66	J	0.65	J	0.68	J	0.57	J	0.7	J						
Americium 241	0.1	U	U	U	U	U	U	U	U	U	U	U	U						
Uranium 238 GEA	0.1	U	U	U	U	U	U	U	U	U	U	U	U						
Uranium 235 GEA	0.1	U	U	U	U	U	U	U	U	U	U	U	U						

N/A = Not Applicable

N812065-01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0324

DATA SHEET

B0T6P1

SDG 7076 Client/Case no Hanford SDG-H0324
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N812065-01 Client sample id B0T6P1
Lapt sample id 7076-001 Location/Matrix 1607-D2 SOLID
Received 12/10/98 Collected 12/08/98 09:20
% solids 99.8 Custody/SAF No B99-005-2 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.21	0.088	0.082	0.30	J	U
Uranium 235	15117-96-1	0.013	0.026	0.10	0.30	U	U
Uranium 238	U-238	0.19	0.088	0.082	0.30	J	U
Potassium 40	13966-00-2	4.2	0.16	0.063			GAM
Cobalt 60	10198-40-0	U		0.007	0.050	U	GAM
Cesium 137	10045-97-3	U		0.006	0.050	U	GAM
Europium 152	14683-23-9	U		0.017	0.10	U	GAM
Europium 154	15585-10-1	U		0.021	0.10	U	GAM
Europium 155	14391-16-3	U		0.019	0.10	U	GAM
Radium 226	13982-63-3	0.15	0.014	0.013	0.10	J	GAM
Radium 228	15262-20-1	0.17	0.026	0.026	0.20	J	GAM
Thorium 228	14274-82-9	0.16	0.009	0.009		J	GAM
Thorium 232	TH-232	0.17	0.026	0.026		J	GAM
Americium 241	14596-10-2	U		0.022		U	GAM
Uranium 238	U-238	U		0.79		U	GAM
Uranium 235	15117-96-1	U		0.029		U	GAM

100 D Areas - Full Protocol

2/2/99

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/21/99

DATA SHEET

SDG	7076	Client/Case no	Hanford SDG-H0324
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N812065-02	Client sample id	B0T6P2
Dept sample id	7076-002	Location/Matrix	1607-D2 SOLID
Received	12/10/98	Collected	12/08/98 09:45
% solids	94.6	Custody/SAF No	B99-005-2 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.49	0.12	0.049	0.30		U
Uranium 235	15117-96-1	0.023	0.031	0.060	0.30	U	U
Uranium 238	U-238	0.44	0.11	0.049	0.30		U
Potassium 40	13966-00-2	11	0.43	0.23			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.050	U	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.068	0.10	U	GAM
Europium 155	14391-16-3	U		0.056	0.10	U	GAM
Radium 226	13982-63-3	0.48	0.043	0.040	0.10	J	GAM
Radium 228	15262-20-1	0.66	0.094	0.091	0.20	J	GAM
Thorium 228	14274-82-9	0.79	0.034	0.031		J	GAM
Thorium 232	TH-232	0.66	0.094	0.091		J	GAM
Americium 241	14596-10-2	U		0.044		U	GAM
Uranium 238	U-238	U		2.6		U	GAM
Uranium 235	15117-96-1	U		0.075		U	GAM

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SUMMARY DATA SECTION
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Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
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N812065-03

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0324

DATA SHEET

B0T6P3

SDG 7076 Client/Case no Hanford SDG-H0324
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N812065-03 Client sample id B0T6P3
Dept sample id 7076-003 Location/Matrix 1607-D2 SOLID
Received 12/10/98 Collected 12/08/98 09:35
% solids 95.0 Custody/SAF No B99-005-2 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.51	0.12	0.050	0.30		U
Uranium 235	15117-96-1	0.016	0.016	0.060	0.30	U	U
Uranium 238	U-238	0.44	0.11	0.050	0.30		U
Potassium 40	13966-00-2	10	0.56	0.29			GAM
Cobalt 60	10198-40-0	U		0.031	0.050	U	GAM
Cesium 137	10045-97-3	U		0.028	0.050	U	GAM
Europium 152	14683-23-9	U		0.064	0.10	U	GAM
Europium 154	15585-10-1	U		0.092	0.10	U	GAM
Europium 155	14391-16-3	U		0.063	0.10	U	GAM
Radium 226	13982-63-3	0.44	0.060	0.051	0.10	4444	GAM
Radium 228	15262-20-1	0.65	0.12	0.11	0.20		GAM
Thorium 228	14274-82-9	0.70	0.046	0.042			GAM
Thorium 232	TH-232	0.65	0.12	0.11			GAM
Americium 241	14596-10-2	U		0.061		U	GAM
Uranium 238	U-238	U		3.4		U	GAM
Uranium 235	15117-96-1	U		0.099		U	GAM

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plm 2/2/99

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/21/99

N812065-04

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0324

DATA SHEET

B0T6P 4

SDG 7076 Client/Case no Hanford SDG-H0324
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N812065-04 Client sample id B0T6P 4
Dept sample id 7076-004 Location/Matrix 1607-D2 SOLID
Received 12/10/98 Collected 12/08/98 09:30
% solids 93.7 Custody/SAF No B99-005-3 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.41	0.11	0.052	0.30		U
Uranium 235	15117-96-1	0.008	0.016	0.063	0.30	U	U
Uranium 238	U-238	0.32	0.098	0.052	0.30		U
Potassium 40	13966-00-2	11	0.56	0.26			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.050	U	GAM
Europium 152	14683-23-9	U		0.062	0.10	U	GAM
Europium 154	15585-10-1	U		0.090	0.10	U	GAM
Europium 155	14391-16-3	U		0.068	0.10	U	GAM
Radium 226	13982-63-3	0.44	0.048	0.046	0.10	J	GAM
Radium 228	15262-20-1	0.68	0.12	0.12	0.20	J	GAM
Thorium 228	14274-82-9	0.59	0.031	0.031		J	GAM
Thorium 232	TH-232	0.68	0.12	0.12		J	GAM
Americium 241	14596-10-2	U		0.099		U	GAM
Uranium 238	U-238	U		3.3		U	GAM
Uranium 235	15117-96-1	U		0.11		U	GAM

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RM 2/2/99

Lab id TMANC
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N812065-05

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0324

DATA SHEET

B0T6P 5

SDG 7076 Client/Case no Hanford SDG-H0324
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N812065-05 Client sample id B0T6P 5
Dept sample id 7076-005 Location/Matrix 1607-D2 SOLID
Received 12/10/98 Collected 12/08/98 10:00
% solids 93.3 Custody/SAF No B99-005-3 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.53	0.14	0.064	0.30		U
Uranium 235	15117-96-1	0.051	0.041	0.078	0.30	U	U
Uranium 238	U-238	0.45	0.12	0.064	0.30		U
Potassium 40	13966-00-2	11	0.36	0.13			GAM
Cobalt 60	10198-40-0	U		0.017	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.050	U	GAM
Europium 152	14683-23-9	0.037	0.020	0.032	0.10	J	GAM
Europium 154	15585-10-1	U		0.050	0.10	U	GAM
Europium 155	14391-16-3	U		0.046	0.10	U	GAM
Radium 226	13982-63-3	0.43	0.031	0.028	0.10	J	GAM
Radium 228	15262-20-1	0.57	0.074	0.076	0.20	J	GAM
Thorium 228	14274-82-9	0.59	0.022	0.020		J	GAM
Thorium 232	TH-232	0.57	0.074	0.076		J	GAM
Americium 241	14596-10-2	U		0.051		U	GAM
Uranium 238	U-238	U		1.8		U	GAM
Uranium 235	15117-96-1	U		0.066		U	GAM

100 D Areas - Full Protocol

RPW 2/2/99

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/21/99

N812065-06

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0324

DATA SHEET

B0T6P 6

SDG 7076 Client/Case no Hanford SDG-H0324
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N812065-06 Client sample id B0T6P 6
Dept sample id 7076-006 Location/Matrix 1607-D2 SOLID
Received 12/10/98 Collected 12/08/98 10:00
% solids 93.3 Custody/SAF No B99-005-3 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.33	0.099	0.061	0.30		U
Uranium 235	15117-96-1	0	0.019	0.074	0.30	U	U
Uranium 238	U-238	0.36	0.12	0.061	0.30		U
Potassium 40	13966-00-2	11	0.47	0.23			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.028	0.050	U	GAM
Europium 152	14683-23-9	U		0.047	0.10	U	GAM
Europium 154	15585-10-1	U		0.081	0.10	U	GAM
Europium 155	14391-16-3	U		0.049	0.10	U	GAM
Radium 226	13982-63-3	0.47	0.050	0.047	0.10	J	GAM
Radium 228	15262-20-1	0.70	0.097	0.093	0.20	J	GAM
Thorium 228	14274-82-9	0.64	0.030	0.028		J	GAM
Thorium 232	TH-232	0.70	0.097	0.093		J	GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.082		U	GAM

100 D Areas - Full Protocol

RPM 2/2/99

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/21/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0324 is comprised of six solid (soil) samples designated under SAF No. B99-005 with a Project Designation of: 100 D Areas - Full Protocol.

The samples were received as stated on the Chain-of-Custody documents.

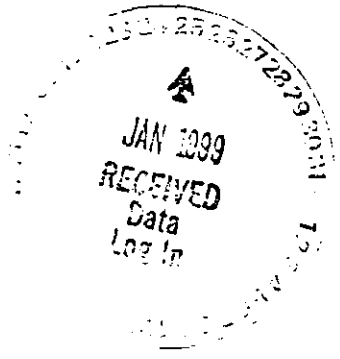
2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

Sample B0T6P5 had an initial yield of less than 1%. A brief investigation determined that the sample had not been traced prior to analysis. The sample was reanalyzed with the appropriate tracer solution added. The reanalysis yield was acceptable. No other problems were encountered.

2.2 Gamma Scan Analyses

No problems were encountered in the processing of the samples.



Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

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Collector: Stankovich/Jacques	Company Contact: Mike Stankovich / Telephone No.: (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code / Data Turnaround: 15 Days
Project Designation: 100 D Areas - Full Protocol	Sampling Location: 1607-D2	SAF No.: B99-005	
Ice Chest No.: 7 OF 13, 8 OF 13, 9 OF 13, 10 OF 13, 11 OF 13, 12 OF 13, 13 OF 13	Field Logbook No.: EL-1339-4	Method of Shipment: Fed Express	
Shipped To: MJ/2498 TMA/~~RECIA~~	Offsite Property No.:	Bill of Lading/Air Bill No.:	
Fig 1A		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS: PCB

Special Handling and/or Storage

	Preservation	Type of Container	No. of Container(s) / Volume	Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions.		
	None	P	1 / 20mL						(2) BAO 11-16-98	(3)			
	None	aG	1 / 60mL										
	Cool 4C	aG	1 / 125mL										
	None	aG	1 / 125mL										
	Cool 4C	aG	1 / 250mL										
	Cool 4C	aG	1 / 250mL										
	None	aG	1 / 250mL										
	None	P	2 / 1000mL										

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time										
B0T6P4	Soil	12-8-98	0930	X	X						X	<1500	A7
B0T6P5	Soil	12-8-98	1000	X	X						X	<1500	A8
B0T6P6	Soil	12-8-98	1000	X	X						X	<1500	A8

0010019

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	12-8-98 1530	Bruce Nielsen / R. Nielsen	12/8/98 1530
Bruce Nielsen / R. Nielsen	12/8/98 1530	Fed Ex	12-9-98
Fed Ex	12-10-98 12:20	[illegible] JA Lowe	12-10-98

SPECIAL INSTRUCTIONS

COA = R607D2 2F00

(1) Gamma Spectroscopy (~~Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155~~); ~~Gamma Spec - Add-on (Americium-241, Uranium-235)~~

BAO 11-16-98

(2) Report Bis(2ethylhexyl)phthalate only BAO 11-16-98

(3) also Barium

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-2	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
Stankovich/Jacques	Mike Stankovich (509) 531-7620	TRENT, SJ		15 Days
Project Designation	**Sampling Location**	**SAF No.**		
100 D Areas - Full Protocol	1607-D2	B99-005		
Ice Chest No. 6 OF 13, 13 OF 13 1 OF 13, 2 OF 13, 3 OF 13, 4 OF 13, 5 OF 13	**Field Logbook No.** EL-1339-4	**Method of Shipment** Fed Express		
Shipped To ~~TMA/RECRA~~ 1400 & 12998	**Offsite Property No.**	**Bill of Lading/Air Bill No.**		
Freq 1A		**COA**		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	Cool 4C	Cool 4C	None	None		
PCB	Type of Container	P	aG	aG	aG	aG	aG	aG	P		
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	2		
	Volume	20mL	60mL	125mL	125mL	250mL	250mL	250mL	1000mL		

SAMPLE ANALYSIS				Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate) (2) MO 11-16-98	ICP Metals - 6010A (Supertrace) (Chromium, Lead) (3)	See Item (1) in Special Instructions.		
Sample No.	Matrix *	Sample Date	Sample Time										
B0T6P1	Soil	12-8-98	0945	X	X						X	<1520 pCi/g	E
B0T6P2	Soil	12-8-98	0945	X	X						X	<1520 pCi/g	A5
B0T6P3	Soil	12-8-98	0935	X	X						X	<1520 pCi/g	A6

0200000

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Stankovich	Date/Time 12-8-98 1530	Received By Karen Nelson / K. Nelson 12/8/98	Date/Time 1530
Relinquished By Karen Nelson / K. Nelson 12/9/98	Date/Time 1322	Received By Fedex	Date/Time 12-9-98 1322
Relinquished By Fed Ex	Date/Time 12-10-98 12:30	Received By [illegible] JR Cossey	Date/Time 12-25-98
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
COA = R607D2 2F00 MO 11-16-98

(1) Gamma Spectroscopy (~~Cesium-137, Cobalt-60~~, Europium-152, ~~Europium-154, Europium-155~~), ~~Gamma Spec - Add-on (Americium-241, Uranium-235)~~

(2) Report Bis(2-ethylhexyl)phthalate only MO 11-16-98

(3) also Barium

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 100-D 1607-D2			DATA PACKAGE: H0324		
VALIDATOR: TLI		LAB: TNU		DATE: 2/1/99	
CASE:			SDG: H0324		

ANALYSES PERFORMED					
☐ Gross Alpha/Beta	☐ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX

B0T6P1 B0T6P2 B0T6P3 B0T6P4
B0T6P5 B0T6P6

Soil

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . Yes No (N/A)

Comments:_____

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A

Initial calibration acceptable? . . . . . Yes No N/A

Standards NIST traceable? . . . . . Yes No N/A

Standards Expired? . . . . . Yes No N/A

Comments:_____

3. Continuing Calibration . . . . . ☒ N/A

Calibration checked within one week of sample analysis? . . .	Yes	No	N/A
Calibration check acceptable?	Yes	No	N/A
Calibration check standards NIST traceable?	Yes	No	N/A
Calibration check standards expired?	Yes	No	N/A

Comments:_____

4. Blanks . . . . . ☐ N/A

Method blank analyzed?	(Yes)	(No)	N/A
Method blank results acceptable?	(Yes)	No	N/A
Analytes detected in method blank?	Yes	(No)	N/A
Field blank(s) analyzed?	(Yes)	No	N/A
Field blank results acceptable?	Yes	(No)	N/A
Analytes detected in field blank(s)?	(Yes)	No	N/A
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: GPA (EB) detect – U-233/234, U-238, K-40, RA-226, RA-228, th-222, th-232

No method blank for Radium 224/228 + Thorium 228/232 -JAH

5. Matrix Spikes . . . . . ☒ N/A

Matrix spike analyzed?	Yes	No	N/A
Spike recoveries acceptable?	Yes	No	N/A
Spike source traceable?	Yes	No	N/A
Spike source expired?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments:_____

A-2

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed?	(Yes)	No	N/A
LCS recoveries acceptable?	(Yes)	No	N/A
LCS traceable?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments:

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added?	(Yes)	No	N/A
Chemical recovery acceptable?	(Yes)	No	N/A
Chemical carrier traceable?	Yes	No	(N/A)
Chemical carrier expired?	Yes	No	(N/A)
Transcription/Calculation errors?	Yes	No	(N/A)

Comments:

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed?	(Yes)	No	N/A
RPD Values Acceptable?	Yes	(No)	N/A
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: thorium 232 – J (34%) (NO TDL)
RA-228 <5x TDL OK

A5/K

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed?	(Yes)	No	N/A
Field duplicate RPD values acceptable?	(Yes)	No	N/A
Field split sample(s) analyzed?	Yes	(No)	N/A
Field split RPD values acceptable?	Yes	No	(N/A)
Performance audit sample(s) analyzed?	Yes	(No)	N/A
Performance audit sample results acceptable?	Yes	No	(N/A)

Comments:

10. Holding Times

Are sample holding times acceptable?	(Yes)	No	N/A

Comments:

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?	Yes	No	(N/A)
Results Acceptable?	(Yes)	No	N/A
Transcription/Calculation errors?	Yes	No	(N/A)
MDA's meet required detection limits?	Yes	(No)	N/A
Transcription/calculation errors?	Yes	No	(N/A)

Comments: U-238 P4, P5, P6, P1, P2, P3
U-235 P4,

A-4/6

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0324

N812065-09

B0T6P1

DUPLICATE

SDG 7076 | Client/Case no Hanford | SDG-H0324

Contact L.A. Johnson | Case no TRB-SBB-207925

DUPLICATE		ORIGINAL	
Lab sample id N812065-09	Lab sample id N812065-01	Client sample id B0T6P1	
Dept sample id 7076-009	Dept sample id 7076-001	Location/Matrix 1607-D2	SOLID
	Received 12/10/98	Collected 12/08/98 09:20	
% solids 99.8	% solids 99.8	Custody/SAF No B99-005-2	B99-005

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 233/234	0.25	0.078	0.049	0.30	J	U	0.21	0.088	0.082	J	17	77
Uranium 235	0.023	0.031	0.059	0.30	U	U	0.013	0.026	0.10	U	-	
Uranium 238	0.16	0.065	0.049	0.30	J	U	0.19	0.088	0.082	J	17	94
Potassium 40	4.4	0.27	0.13			GAM	4.2	0.16	0.063		5	34
Cobalt 60	U		0.017	0.050	U	GAM	U		0.007	U	-	
Cesium 137	U		0.013	0.050	U	GAM	U		0.006	U	-	
Europium 152	U		0.028	0.10	U	GAM	U		0.017	U	-	
Europium 154	U		0.052	0.10	U	GAM	U		0.021	U	-	
Europium 155	U		0.029	0.10	U	GAM	U		0.019	U	-	
Radium 226	0.19	0.030	0.027	0.10		GAM	0.15	0.014	0.013		24	44
Radium 228	0.12	0.062	0.067	0.20	J	GAM	0.17	0.026	0.026	J	34	77
Thorium 228	0.21	0.023	0.021			GAM	0.16	0.009	0.009		27	38
Thorium 232	0.12	0.062	0.067			GAM	0.17	0.026	0.026		34	77
Americium 241	U		0.021		U	GAM	U		0.022	U	-	
Uranium 238	U		1.8		U	GAM	U		0.79	U	-	
Uranium 235	U		0.049		U	GAM	U		0.029	U	-	

100 D Areas - Full Protocol

QC-DUP#1 29838

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/21/99

N812065-08

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0324

METHOD BLANK

Method Blank

SDG 7076 Client/Case no Hanford SDG-H0324
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N812065-08 Client sample id Method Blank
Dept sample id 7076-008 Material/Matrix SOLID
SAF No B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.020	0.027	0.051	0.30	U	U
Uranium 235	15117-96-1	0	0.016	0.062	0.30	U	U
Uranium 238	U-238	0.007	0.013	0.051	0.30	U	U
Potassium 40	13966-00-2	U		0.059		U	GAM
Cobalt 60	10198-40-0	U		0.004	0.050	U	GAM
Cesium 137	10045-97-3	U		0.005	0.050	U	GAM
Europium 152	14683-23-9	U		0.012	0.10	U	GAM
Europium 154	15585-10-1	U		0.013	0.10	U	GAM
Europium 155	14391-16-3	U		0.011	0.10	U	GAM
Americium 241	14596-10-2	U		0.010		U	GAM
Uranium 238	U-238	U		0.52		U	GAM
Uranium 235	15117-96-1	U		0.017		U	GAM

100 D Areas - Full Protocol

QC-BLANK 29837

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/21/99

Date: 5 February 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 1607-D2
Subject: Semivolatiles - Data Package No. H0324-RLN (SDG No. H0324)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0324-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0T6P1	12/8/98	Soil	C	See note 1
B0T6P2	12/8/98	Soil	C	See note 1
B0T6P3	12/8/98	Soil	C	See note 1
B0T6P4	12/8/98	Soil	C	See note 1
B0T6P5	12/8/98	Soil	C	See note 1
B0T6P6	12/8/98	Soil	C	See note 1

1 - Semivolatiles by EPA 8270B (TCL) {bis(2-ethylhexyl)phthalate}.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

  If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

  Holding times were met for all samples.

- **Blanks**

  Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

  All method blank results were acceptable.

  <u>Equipment Blanks</u>

  One equipment blank (B0T6P1) was submitted for analysis. No analytes were detected in the equipment blank.

- **Accuracy**

  Matrix Spike/Matrix Spike Duplicate Recoveries

  Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within limits established by the laboratory. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

  All matrix spike/matrix spike duplicate results were acceptable.

  Surrogate Recovery

  The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the CRQL are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

  All surrogate recovery results were acceptable.

- **Precision**

  Matrix Spike/Matrix Spike Duplicate Samples

  Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and

the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate results were acceptable.

Field Duplicates

One sample duplicate pair (B0T6P5/B0T6P6) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The laboratory reported detection limit for bis(2-ethylhexyl)phthalate were above the CRDL (no TDLs were available) for samples B0P6P2, B0P6P3, B0P6P4, B0P6P5, and B0P6P6. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data package No. H0324 (SDG No. H0324) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The laboratory reported detection limit for bis(2-ethylhexyl)phthalate were above the CRDL (no TDLs were available) for samples B0P6P2, B0P6P3, B0P6P4, B0P6P5, and B0P6P6. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

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Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0324	REVIEWER: TLI	DATE: 2/5/99	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (UG/KG) Page__1__ of__1__

Project: BECHTEL-HANFORD																					
Laboratory: RECRA LabNet																					
Case:	SDG: H0324																				
Sample Number		B0T6P1		B0T6P2		B0T6P3		B0T6P4		B0T6P5		B0T6P6									
Location				A5		A6		A7		A8		A8									
Remarks		Equip. Blank										Duplicate									
Sample Date		12/8/98		12/8/98		12/8/98		12/8/98		12/8/98		12/8/98									
Extraction Date		12/22/98		12/22/98		12/22/98		12/22/98		12/22/98		12/22/98									
Analysis Date		12/29/98		12/28/98		12/28/98		12/28/98		12/28/98		12/29/98									
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
bis(2-Ethylhexyl)phthalate	330	330	U	350	U	350	U	360	U	350	U	360	U								

004

	Cust ID:	B0T6P1		B0T6P1		B0T6P1		B0T6P2		B0T6P3		B0T6P4	
Sample	RFW#:	001		001 MS		001 MSD		002		003		004	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
	Nitrobenzene-d5	65	%	79	%	65	%	61	%	54	%	47	%
Surrogate	2-Fluorobiphenyl	66	%	81	%	66	%	62	%	55	%	51	%
Recovery	p-Terphenyl-d14	73	%	91	%	70	%	69	%	61	%	59	%
			fl		fl		fl		fl		fl		fl
bis(2-Ethylhexyl)phthalate		330	U	330	U	330	U	350	U	350	U	360	U

	Cust ID:	B0T6P5		B0T6P6		SBLKNQ		SBLKNQ BS	
Sample	RFW#:	005		006		98LE1875-MB1		98LE1875-MB1	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
	Nitrobenzene-d5	49	%	59	%	66	%	71	%
Surrogate	2-Fluorobiphenyl	50	%	63	%	68	%	72	%
Recovery	p-Terphenyl-d14	56	%	74	%	77	%	78	%
			fl		fl		fl		fl
bis(2-Ethylhexyl)phthalate		350	U	360	U	330	U	330	U

*= Outside of EPA CLP QC limits.

000013

JW 2/4/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-005
RFW #: 9812L630.
SDG/SAF #: H0324/ B99-005

W.O. #: 10985-001-001-9999-00
Date Received: 12-10-98

SEMIVOLATILE

Six (6) soil samples were collected on 12-08-98.

The samples and their associated QC samples were extracted on 12-22-98 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compound Bis(2-ethylhexyl)phthalate on 12-28,29-98.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. All required holding times for extraction and analysis were met.

3. Non-target compounds were not detected in these samples.

4. All surrogate recoveries were within EPA QC limits.

5. All blank and matrix spike recoveries were within EPA QC limits. The target compound is not included in the spiking solution. (CLP spike recoveries have been used for this analyses).

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-06-98
Date

som\gonup\data\bna\tnu12630.doc

001

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B99-005-3 | Page 1 of 1

Collector: Stankovich/Jacques	Company Contact: Mike Stankovich	Telephone No.: (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code
Project Designation: 100 D Areas - Full Protocol	Sampling Location: 1607-D2		SAF No.: B99-005	Data Turnaround: 15 Day
Ice Chest No.: 4 of 6, 5 of 6, 6 of 6	Field Logbook No.: EL-1339-4		Method of Shipment: Fed Express	
Shipped To: ~~TMA~~/RECRA 1/S 12998	Offsite Property No.		Bill of Lading/Air Bill No.	
Frig 1A			CCA	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	Cool 4C	Cool 4C	None	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	125mL	125mL	250mL	250mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate) ② 11-16-98	ICP Metals - 6010A (Supertrace) (Chromium, Lead) ③	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time										
B0T6P4	Soil	12-8-98	0950			x	x	x	x	x		<1500	A7
B0T6P5	Soil	12-8-98	1000			x	x	x	x	x		<1500	A8
B0T6P6	Soil	12-8-98	1000			x	x	x	x	x		<1500	A8

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Stankovich	Date/Time: 12-8-98 1530	Received By: Renee Nielson / R Nielson	Date/Time: 12/8/98 1530
Relinquished By: Renee Nielson / R Nielson	Date/Time: 12/9/98 1330	Received By: Fed Ex	Date/Time
Relinquished By: Fed Ex	Date/Time	Received By: [illegible]	Date/Time: 12/10/98 1022
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
COA = R607D2 2F00 — 11-16-98
(1) Gamma Spectroscopy (~~Cesium-137, Cobalt-60~~, Europium-152, ~~Europium-154, Europium-155), Gamma Spec - Add-on (Americium-241, Uranium-238)~~
② Report Bis (2ethylhexyl) phthalate only 11-16-98
③ also Barium

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 100-D 1607-D2			DATA PACKAGE: H0324		
VALIDATOR: JLI		LAB: RLN		DATE: 2/1/95	
CASE:			SDG: H0324		

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☒ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX

B0T6P1 B0T6P2 B0T6P3 B0T6P4
B0T6P5 B0T6P6

Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

A-1/2

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are continuing calibrations acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A
Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
Were MS/MSD samples analyzed? . . . . . Yes No N/A
Are MS/MSD results acceptable? . . . . . Yes No N/A
Comments: No MS/MSD — J all (received 3/19-)

terphenyl ✓

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable?	Yes	No	N/A
Are field duplicate RPD values acceptable?	Yes	No	N/A
Are field split RPD values acceptable?	Yes	No	N/A

Comments: didn't run ms/msD (received 3/17)

7. SYSTEM PERFORMANCE

Were internal standards analyzed?	Yes	No	N/A
Are internal standard areas acceptable?	Yes	No	N/A
Are internal standard retention times acceptable?	Yes	No	N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable?	Yes	No	N/A
Is compound quantitation acceptable?	Yes	No	N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses?	Yes	No	N/A
Are all results supported in the raw data?	Yes	No	N/A
Do results meet the CRQLs?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

Comments: all but P1 over CRDL - No TDL

Date: 5 February 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 1607-D2
Subject: Inorganics - Data Package No. H0324-RLN (SDG No. H0324)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0324-RLN prepared by Reca LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0T6P1	12/8/98	Soil	C	See note 1
B0T6P2	12/8/98	Soil	C	See note 1
B0T6P3	12/8/98	Soil	C	See note 1
B0T6P4	12/8/98	Soil	C	See note 1
B0T6P5	12/8/98	Soil	C	See note 1
B0T6P6	12/8/98	Soil	C	See note 1

1- ICP metals (barium, chromium, lead) by 6010B; mercury by 7471A; chromium VI by 7196

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for chromium mercury and ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed

within six (6) months for ICP metals; 30 days for chrome VI; and 28 days for mercury.

All holding times were acceptable.

- **Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations (in ug/L) less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Chromium (total) and lead were detected in preparation blank. No action was taken since all samples but B0T6P1were greater than 5X the blank. Sample B0T6P1 is an equipment blank and qualification with a "U" would mask the fact that both analytes were detected above the IDL.

All other preparation blank results were acceptable.

Equipment Blanks

One equipment blank (B0T6P1) was submitted for analysis. Chromium (total), lead and barium were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

  All matrix spike recovery results were acceptable.

- **Precision**

  Laboratory Duplicate Samples

  Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

  The analysis for chromium VI used the equipment blank for the duplicate analysis. Under the BHI statement of work, no qualification is required.

  All laboratory duplicate results were acceptable.

  Field Duplicates

  One sample duplicate pair (B0T6P5/B0T6P6) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The instrument detection limit exceeded the TDL in all samples for chromium VI. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data package No. H0324-RLN (SDG No. H0324) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Chromium (total) and lead were detected in preparation blank. No action was taken since all samples but B0T6P1were greater than 5X the blank. Sample B0T6P1 is an equipment blank and qualification with a "U" would mask the fact that both analytes were detected. The instrument detection limit exceeded the TDL in all samples for chromium VI. The analysis for chromium VI used the equipment blank for the duplicate analysis. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0324	REVIEWER: TLI	DATE: 2/5/99	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																	
Laboratory: Recra LabNet																	
Case	SDG: H0324																
Sample Number		B0T6P1		B0T6P2		B0T6P3		B0T6P4		B0T6P5		B0T6P6					
Location				A5		A6		A7		A8		A8					
Remarks		Equip. Blank										Duplicate					
Sample Date		12/08/98		12/8/98		12/8/98		12/8/98		12/8/98		12/8/98					
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Barium		1.3		51.3		53.1		60.3		56.6		50.6					
Chromium (total)	0.5	0.2		6.1		4.6		5.8		5.3		4.8					
Mercury	0.05	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U				
Lead	2	0.42		3		3.2		3		4		3.4					
Chromium VI	0.1	0.8	U	0.84	U	0.85	U	0.86	U	0.85	U	0.86	U				

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/04/99

CLIENT: TNU-HANFORD B99-005 RECRA LOT #: 9812L630

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0T6P1	Barium, Total	1.3	MG/KG	0.03	1.0
		Chromium, Total	0.20	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	0.42	MG/KG	0.15	1.0
-002	B0T6P2	Barium, Total	51.3	MG/KG	0.03	1.0
		Chromium, Total	6.1	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.0	MG/KG	0.18	1.0
-003	B0T6P3	Barium, Total	53.1	MG/KG	0.06	2.0
		Chromium, Total	4.6	MG/KG	0.13	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.2	MG/KG	0.36	2.0

2/2/99

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/04/99

CLIENT: TNU-HANFORD B99-005 RECRA LOT #: 9812L630

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	B0T6P4	Barium, Total	60.3	MG/KG	0.05	2.0
		Chromium, Total	5.8	MG/KG	0.1	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.0	MG/KG	0.28	2.0
-005	B0T6P5	Barium, Total	56.6	MG/KG	0.04	2.0
		Chromium, Total	5.3	MG/KG	0.09	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	0.25	2.0
-006	B0T6P6	Barium, Total	50.6	MG/KG	0.04	2.0
		Chromium, Total	4.8	MG/KG	0.09	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.4	MG/KG	0.25	2.0

2/2/99

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/28/98

CLIENT: TNU-HANFORD B99-005 RECRA LOT #: 9812L630

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0T6P1	% Solids	100	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	1.0
-002	B0T6P2	% Solids	94.9	%	0.01	1.0
		Chromium VI	0.84 u	MG/KG	0.84	1.0
-003	B0T6P3	% Solids	94.5	%	0.01	1.0
		Chromium VI	0.85 u	MG/KG	0.85	1.0
-004	B0T6P4	% Solids	93.6	%	0.01	1.0
		Chromium VI	0.86 u	MG/KG	0.86	1.0
-005	B0T6P5	% Solids	94.4	%	0.01	1.0
		Chromium VI	0.85 u	MG/KG	0.85	1.0
-006	B0T6P6	% Solids	93.2	%	0.01	1.0
		Chromium VI	0.86 u	MG/KG	0.86	1.0

RLK 2/2/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-005
RFW# : 9812L630
SDG/SAF# : H0324/B99-005

W.O.# : 10985-001-001-9999-00
Date Received: 12-10-98

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.

2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits except the ending CCV for Chromium and Lead (118.9% and 122.2%). Samples B0T6P1, B0T6P2, and the replicate were not impacted. The remaining samples were rerun at a two-fold dilution and the CCV again went out for Chromium and Lead (113.6% and 116.4%). Other files were completed between these runs and the instrument maintained its calibration. When the remaining samples were run at a two fold dilution, the CCV recoveries were still out but were not as high as the original run. It appears that sample matrix caused the high CCV recoveries. If the sample results were corrected to reflect the CCV concentration, the results would still be above the PQL.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.

7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. All MSs and MSDs were within the 20% Relative Percent Difference (RPD) control limits.

 13 060015

11. All MSs and MSDs were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

Pat C

J. Michael Taylor
Vice President
Lionville Analytical Laboratory

1-5 99
Date

jjw/ml2-630

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-005
RFW# : 9812L630
SDG# : H0324
SAF# : B99-005

W.O. # : 10985-001-001-9999-00
Date Received: 12-10-98

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.

8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-30-98
Date

njp\12-630

209 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

... Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-005-2 | Page 1 of

Collector: Stankovich/Jacques	Company Contact: Mike Stankovich	Telephone No.: (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code: 630
Project Designation: 100 D Areas - Full Protocol	Sampling Location: 1607-D2		SAF No.: B99-005	Data Turnaround: 15 Da[ys]
Ice Chest No.: 1 of 6, 2 of 6, 3 of 6	Field Logbook No.: EL-1339-4		Method of Shipment: Fed Express	
Shipped To: ~~IMA~~/RECRA 12598	Offsite Property No.		Bill of Lading/Air Bill No.: 4019645431 - 6.0°C	
Frig 1A			COA	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	Cool 4C	Cool 4C	None	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	125mL	125mL	250mL	250mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) [Bis(2-ethylhexyl) phthalate] ② 11-16-98	ICP Metals - 6010A (Supertrace) [Chromium, Lead] ③	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time										
B0T6P1	Soil	12-8-98	0920			X	X	X	X	X		<isar	F
B0T6P2	Soil	12-8-98	0945			X	X	X	X	X		<isar	A5
B0T6P3	Soil	12-8-98	0935			X	X	X	X	X		<isar	A6

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Stankovich	Date/Time: 12-8-98 1530	Received By: B. Nielson / B Nielson	Date/Time: 12/8/98 1530
Relinquished By: B. Nielson / B. Nielson	Date/Time: 12/9/98 1330	Received By: Fed Ex	Date/Time
Relinquished By: Fed Ex	Date/Time	Received By: [signature]	Date/Time: 12/10/98 1022
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
COA = R607D2 2F00

(1) Gamma Spectroscopy {~~Cesium-137, Cobalt-60~~, Europium-152, ~~Europium-154, Europium-155~~}, ~~Gamma Spec - Add-on {Americium-241, Uranium-238}~~ 11-16-98

② Report Bis(2-ethylhexyl)phthalate only 11-16-98

③ also Barium

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000018

000019

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-3	Page 1 of

Collector: Stankovich/Jacques	Company Contact: Mike Stankovich — Telephone No. (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code
Project Designation: 100 D Areas - Full Protocol	Sampling Location: 1607-D2	SAF No.: B99-005	Data Turnaround: 15 Da[ys]
Ice Chest No.: 4 of 6, 5 of 6, 6 of 6	Field Logbook No.: EL-1339-4	Method of Shipment: Fed Express	
Shipped To: ~~TMA~~/RECRA 12998	Offsite Property No.	Bill of Lading/Air Bill No.	
Eng 1A		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	Cool 4C	Cool 4C	None	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	125mL	125mL	250mL	250mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate) ② [initials] 11-16-98	ICP Metals - 6010A (Supertrace) (Chromium, Lead) ③	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Isotopic Uranium	Chromium Hex	Mercury	PCBs	Semi-VOA	ICP Metals	See item (1)		
B0T6P4	Soil	12-8-98	0950			X	X	X	X	X		[illegible]	A7
B0T6P5	Soil	12-8-98	1000			X	X	X	X	X		[illegible]	A8
B0T6P6	Soil	12-8-98	1000			X	X	X	X	X		[illegible]	A8

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature] Stankovich	Date/Time: 12-8-98 1530	Received By: [signature] R Nielson	Date/Time: 12/8/98 1530
Relinquished By: [signature] R Nielson	Date/Time: 12/9/98 1330	Received By: Fed Ex	Date/Time
Relinquished By: Fed Ex	Date/Time	Received By: [signature]	Date/Time: 12/10/98 1033
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
COA – R607D2 2F00 [initials] 11-16-98

(1) Gamma Spectroscopy (~~Cesium-137, Cobalt-60~~, Europium-152, ~~Europium-154, Europium-155), Gamma Spec - Add-on (Americium-241, Uranium-238)~~)

② Report Bis (2ethylhexyl) phthalate only [initials] 11-16-98
③ also Barium

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 100-D WS 1607-D2			DATA PACKAGE: H0324		
VALIDATOR: TLI		LAB: Recra Lab Not		DATE: 2/1/99	
CASE:			SDG: H0324		
ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☒ Cr VI	☐
SAMPLES/MATRIX Soil					
B0T6P1 B0T6P2 B0T6P3 B0T6P4					
B0T6P5 B0T6P6					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

A-19 pkc

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments?	Yes	No	(N/A)
Are initial calibrations acceptable?	Yes	No	(N/A)
Are ICP interference checks acceptable?	Yes	No	(N/A)
Were ICV and CCV checks performed on all instruments?	Yes	No	(N/A)
Are ICV and CCV checks acceptable?	Yes	No	(N/A)

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses?	Yes	No	(N/A)
Are ICB and CCB results acceptable?	Yes	No	(N/A)
Were preparation blanks analyzed?	(Yes)	No	N/A
Are preparation blank results acceptable?	Yes	(No)	N/A
Were field/trip blanks analyzed?	(Yes)	No	N/A
Are field/trip blank results acceptable?	Yes	(No)	N/A

Comments: Cr + Pb in blank (lab)
Cr → 6P1 - equipment blank - don't U,
Pb → 6P1 - E. Blank - don't U > note in report

EB- (P1) Barium, Chrome, Pb

5. ACCURACY

Were spike samples analyzed?	(Yes)	No	N/A
Are spike sample recoveries acceptable?	(Yes)	No	N/A
Were laboratory control samples (LCS) analyzed?	Yes	No	(N/A)
Are LCS recoveries acceptable?	Yes	No	(N/A)

Comments: CR DT ? check have MS + dup ok

A-20

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed?	Yes	No	N/A
Are laboratory duplicate samples RPD values acceptable?	Yes	No	N/A
Were ICP serial dilution samples analyzed?	Yes	No	N/A
Are ICP serial dilution %D values acceptable?	Yes	No	N/A
Are field duplicate RPD values acceptable?	Yes	No	N/A
Are field split RPD values acceptable?	Yes	No	N/A

Comments:
⇒ CRVI – used the FB for duplicat- in report

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required?	Yes	No	N/A
Are duplicate injection %RSD values acceptable?	Yes	No	N/A
Were analytical spikes performed as required?	Yes	No	N/A
Are analytical spike recoveries acceptable?	Yes	No	N/A
Was MSA performed as required?	Yes	No	N/A
Are MSA results acceptable?	Yes	No	N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses?	Yes	No	N/A
Are all results supported in the raw data?	Yes	No	N/A
Are results calculated properly?	Yes	No	N/A
Do results meet the CRDLs?	Yes	No	N/A

Comments: CR VI allow CRDL

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/04/99

CLIENT: TNU-HANFORD B99-005

RECRA LOT #: 9812L630

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	98L1473-MB1	Barium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.15	MG/KG	0.06	1.0
		Lead, Total	0.26	MG/KG	0.17	1.0
BLANK1	98C0572-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Date: 5 February 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 1607-D2
Subject: PCB - Data Package No. H0324-RLN (SDG No. H0324)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0324-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0T6P1	12/8/98	Soil	C	PCBs - 8081 (TCL)
B0T6P2	12/8/98	Soil	C	PCBs - 8081 (TCL)
B0T6P3	12/8/98	Soil	C	PCBs - 8081 (TCL)
B0T6P4	12/8/98	Soil	C	PCBs - 8081 (TCL)
B0T6P5	12/8/98	Soil	C	PCBs - 8081 (TCL)
B0T6P6	12/8/98	Soil	C	PCBs - 8081 (TCL)

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

  If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

  Holding times were met for all samples.

- **Blanks**

  Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

  All method blank target compound results were acceptable.

  Equipment Blanks

  One equipment blank (B0T6P1) was submitted for analysis. No analytes were detected in the equipment blank although the detection limit for aroclor-1221 was above the target detection limit (TDL).

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be

within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the matrix spike/matrix spike duplicates not being run with the samples (14 and 15 days afterward, respectively), all results were qualified as estimates and flagged "J".

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the matrix spike/matrix spike duplicates not being run with the samples (14 and 15 days afterward, respectively), all results were qualified as estimates and flagged "J".

Field Duplicates

One sample duplicate pair (B0T6P5/B0T6P6) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan TDLs or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The laboratory instrument detection limit for aroclor-1221 was above the TDL for all samples. Unde the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data Package No. H0324-RLN (SDG No. H0324) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the matrix spike/matrix spike duplicates not being run with the samples (14 and 15 days afterward, respectively), all results were qualified as estimates and flagged "J". The laboratory instrument detection limit for aroclor-1221 was above the TDL for all samples. Unde the BHI statement of work, no qualification is required. Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0324	REVIEWER: TLI	DATE: 2/5/99	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	MS/MSD not run with SDG

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																							
Laboratory: Recra LabNet																							
Case	SDG: H0324																						
Sample Number		B0T6P1		B0T6P2		B0T6P3		B0T6P4		B0T6P5		B0T6P6											
Location				A5		A6		A7		A8		A8											
Remarks		Equip. Blank										Duplicate											
Sample Date		12/08/98		12/08/98		12/08/98		12/08/98		12/08/98		12/08/98											
PCB	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Arochlor-1016	50	33	UJ	35	UJ	35	UJ	36	UJ	35	UJ	36	UJ										
Arochlor-1221	50	67	UJ	70	UJ	71	UJ	71	UJ	71	UJ	72	UJ										
Arochlor-1232	50	33	UJ	35	UJ	35	UJ	36	UJ	35	UJ	36	UJ										
Arochlor-1242	50	33	UJ	35	UJ	35	UJ	36	UJ	35	UJ	36	UJ										
Arochlor-1248	50	33	UJ	35	UJ	35	UJ	36	UJ	35	UJ	36	UJ										
Arochlor-1254	50	33	UJ	35	UJ	35	UJ	36	UJ	35	UJ	36	UJ										
Arochlor-1260	50	33	UJ	35	UJ	35	UJ	36	UJ	35	UJ	36	UJ										

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 01/08/99 11:58

RFW Batch Number: **9812L630** Client: **TNU-HANFORD B99-005** Work Order: 10985001001 Page: 1

	Cust ID:	B0T6P1	B0T6P1	B0T6P1	B0T6P2	B0T6P3	B0T6P4
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	85 %	98 %	90 %	82 %	90 %	82 %
	Decachlorobiphenyl	95 %	111 %	104 %	96 %	100 %	94 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		33 U J	33 U	33 U	35 U J	35 U J	36 U J
Aroclor-1221		67 U	67 U	67 U	70 U	71 U	71 U
Aroclor-1232		33 U	33 U	33 U	35 U	35 U	36 U
Aroclor-1242		33 U	33 U	33 U	35 U	35 U	36 U
Aroclor-1248		33 U	33 U	33 U	35 U	35 U	36 U
Aroclor-1254		33 U	89 %	86 %	35 U	35 U	36 U
Aroclor-1260		33 U	33 U	33 U	35 U	35 U	36 U

	Cust ID:	B0T6P5	B0T6P6	PBLKXV	PBLKXV BS	PBLKYX	PBLKYX BS
Sample Information	RFW#:	005	006	98LE1869-MB1	98LE1869-MB1	99LE0004-MB1	99LE0004-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	90 %	82 %	78 %	82 %	100 %	95 %
	Decachlorobiphenyl	103 %	96 %	90 %	94 %	109 %	109 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		35 U J	36 U J	33 U	33 U	33 U	33 U
Aroclor-1221		71 U	72 U	67 U	67 U	67 U	67 U
Aroclor-1232		35 U	36 U	33 U	33 U	33 U	33 U
Aroclor-1242		35 U	36 U	33 U	33 U	33 U	33 U
Aroclor-1248		35 U	36 U	33 U	33 U	33 U	33 U
Aroclor-1254		35 U	36 U	33 U	88 %	33 U	87 %
Aroclor-1260		35 U	36 U	33 U	33 U	33 U	33 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

0000011

11/3/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-005
RFW#: 9812L630
SDG/SAF#: H0324/B99-005

W.O.#: 10985-001-001-9999-00
Date Received: 12-10-98

PCB

The set of samples consisted of six (6) soil samples collected on 12-08-98.

The samples and their associated QC samples were extracted on 12-21-98 and 01-04,06-99 and analyzed based on SW846, 3rd Edition on 12-23,24-98 and 01-06,07-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custodies.

2. All required holding times for extraction and analysis have been met with the exception of the matrix spike and matrix spike duplicate for sample B0T6P1. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.

4. The method blanks were below the reporting limits for all target compounds.

5. All surrogate recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-11-99
Date

pef\r:\group\data\pcb\12L-630.pcb

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-005-2 | Page 1 of 1

Collector: Stankovich/Jacques	Company Contact: Mike Stankovich	Telephone No.: (509) 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 D Areas - Full Protocol	Sampling Location: 1607-D2		SAF No.: B99-005
Ice Chest No.: 1 of 6, 2 of 6, 3 of 6	Field Logbook No.: EL-1339-4		Method of Shipment: Fed Express
Shipped To: ~~EMA~~/RECRA 11/12/98	Offsite Property No.		Bill of Lading/Air Bill No.: 401964543 1 - 6.0°C
Freq 1A			COA

Price Code: 6030 | Data Turnaro: 15 Da

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	None	Cool 4C	None	Cool 4C	Cool 4C	None	None		
				Type of Container	P	aG	aG	aG	aG	aG	aG	P		
				No. of Container(s)	1	1	1	1	1	1	1	2		
				Volume	20mL	60mL	125mL	125mL	250mL	250mL	250mL	1000mL		
				SAMPLE ANALYSIS	Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate) (2) mo 11-16-98	ICP Metals - 6010A (Supertrace) (Chromium, Lead) (3)	See item (1) in Special Instructions		
B0T6P1	Soil	12-8-98	0920				X	X	X	X	X		Kisak	E
B0T6P2	Soil	12-8-98	0945				X	X	X	X	X		Kisak	A5
B0T6P3	Soil	12-8-98	0935				X	X	X	X	X		Kisak	A6

0000114

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	12-8-98 1530	K Nielsen/L Nielsen	12/8/98 1530
K Nielsen/L. Nielsen	12/9/98 1330	Fed Ex	
Fed Ex		Yoder	12/10/98 1022

SPECIAL INSTRUCTIONS
COA = R607D2 2F00 mo 11-16-98

(1) Gamma Spectroscopy (~~Cesium-137, Cobalt-60~~, Europium-152, ~~Europium-154, Europium-155~~), Gamma Spec - Add on (Americium-241, Uranium-238)

(2) Report Bis(2-ethylhexyl)phthalate only mo 11-16-98

(3) also Barium

Matrix *: Soil; Water; Vapor; Other Solid; Other Liquid

LABORATORY SECTION: Received By ____ Title ____ Date/Time ____

FINAL SAMPLE DISPOSITION: Disposal Method ____ Disposed By ____ Date/Time ____

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-3	Page 1 of 1

Collector Stankovich/Jacques	Company Contact Mike Stankovich	Telephone No. (509) 531-7620	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 1607-D2		SAF No. B99-005		
Ice Chest No. 4 of 6, 5 of 6, 6 of 6	Field Logbook No. EL-1339-4		Method of Shipment Fed Express		
Shipped To ~~TMA~~/RECRA 12998	Offsite Property No.		Bill of Lading/Air Bill No.		
Frig 1A			CCA		

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	Cool 4C	Cool 4C	None	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	125mL	125mL	250mL	250mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Isotopic Uranium	Chromium Hex - 7196	Mercury - 7471 - (CV)	PCBs - 8080	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate) ② 11-16-98	ICP Metals - 6010A (Supertrace) (Chromium, Lead) ③	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time	[redacted]										
B0T6P4	Soil	12-8-98	0930			X	X	X	X	X		<15arL	A7
B0T6P5	Soil	12-8-98	1000			✓	✓	✓	X	X		<15arL	A8
B0T6P6	Soil	12-8-98	1000			✓	X	✓	X	X		<15arL	A8

CHAIN OF POSSESSION	Sign/Print Names			
Relinquished By Stankovich	Date/Time 12-8-98 1530	Received By Renee Nielson / R Nielson	Date/Time 12/8/98 1530
Relinquished By Renee Nielson / R Nielson	Date/Time 12/9/98 1330	Received By Fedex	Date/Time
Relinquished By Fedex	Date/Time	Received By [signature]	Date/Time 12/10/98 1035
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
COA = R607D2 2F00 11-16-98
(1) Gamma Spectroscopy (~~Cesium-137, Cobalt-60~~, Europium-152, ~~Europium-154, Europium-155); Gamma Spec - Add on (Americium-241, Uranium-238)~~
② Report Bis(2ethylhexyl)phthalate only 11-16-98
③ also Barium

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000015

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 100-D 1607-D2			DATA PACKAGE: H0324		
VALIDATOR: TLI		LAB: RLN		DATE: 2/1/99	
CASE:			SDG: H0324		
ANALYSES PERFORMED					
☐ CLP3/90	☐ SW-846 8080	☒ SW-846 8081	☐	☐	☐
SAMPLES/MATRIX					
B0T6P1, B0T6P2, B0T6P3, B0T6P4					
B0T6P5, B0T6P6					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No (N/A)

Are calibration standard retention times acceptable? . . . . . Yes No (N/A)

Are DDT and endrin breakdowns acceptable? . . . . . Yes No (N/A)

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? . . . . . Yes No N/A

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Comments:_____

_____

_____

_____

_____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? . . . . . Yes No N/A

Are quantitation column calibration factor %RSD values acceptable? . . . . . Yes No N/A

Were the analytical sequence requirements met? . . . . . Yes No N/A

Are continuing calibration %D values acceptable? . . . . . Yes No N/A

Comments:_____

_____

_____

_____

_____

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? . . . . . Yes No N/A

Was the resolution acceptable in the resolution check mix? . . Yes No N/A

Is resolution acceptable in the PEM, INDA and INDB? . . . . . Yes No N/A

Are DDT and Endrin breakdowns acceptable? . . . . . Yes No N/A

Are retention times in PEMs and calibration mixes acceptable? . Yes No N/A

Are RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are %RSD values acceptable? . . . . . Yes No N/A

Comments:_____

_____

_____

_____

_____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? . . . . . Yes No N/A

Is resolution acceptable in the PEMs? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes?	Yes	No	N/A
Are RPD values in the PEMs acceptable?	Yes	No	N/A
Are the DDT and endrin breakdowns acceptable?	Yes	No	N/A
Was GPC cleanup performed?	Yes	No	N/A
Is the GPC calibration check acceptable?	Yes	No	N/A
Was Florisil cleanup performed?	Yes	No	N/A
Is the Florisil performance check acceptable?	Yes	No	N/A

Comments: _____

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments: Aroclor 1221 – Lab def Limitations TDL

5. ACCURACY

Were surrogates analyzed?	Yes	No	N/A
Are surrogate recoveries acceptable?	Yes	No	N/A
Were MS/MSD samples analyzed?	Yes	No	N/A
Are MS/MSD results acceptable?	Yes	No	N/A
Were LCS samples analyzed?	Yes	No	N/A
Are LCS results acceptable?	Yes	No	N/A

Comments: MS/MSD ~~was~~ were not run w/the samples (14/15 days later) ~~ET~~ J all

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes (No) N/A
Are laboratory duplicate results acceptable? . . . . . Yes (No) N/A
Are field duplicate RPD values acceptable? . . . . . (Yes) No N/A
Are field split RPD values acceptable? . . . . . Yes No (N/A)
Comments: No RPD calculated - MS/MSD were run 14/15 days after samples J - all

7. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? . . . . . Yes No (N/A)
Are positive results resolved acceptably? . . . . . Yes No N/A
Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No (N/A)
Is compound quantitation acceptable? . . . . . Yes No (N/A)
Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A
Are all results supported in the raw data? . . . . . Yes No (N/A)
Do results meet the CRQLs? . . . . . Yes (No) N/A
Comments: NO - Arochlor - 1221 over +DL in all samples

A-8

Recra LabNet Philadelphia Sample Discrepancy Report (SDR)

SDR #: 98GC413

Initiator: B Astor
Date: 12/23/98
Client: TWU - Hartford

RFW Batch: 9812L630 & 9812L631
Samples: All
Method: SW846/MCAWW/CLP/

Parameter: OPCB
Matrix: Soil
Prep Batch: 98LE1869 98LE1859

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy
__ Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

Matrix QC is specified on chain but no MS/MSD was extracted

- Both samples in batch 9812L631 required a 50x dilution due target compounds.
- A MS/MSD on either of these samples would not give any more information because the

2. Known or Probable Causes(s) Spike would be diluted out.

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: _____

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

extract MS/MSD for 9812L630

5. Final Action...signature/date: C. Eaff Other Explanation:

X Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Batch # 98LE0004

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Doughty
__	X Lab Manager: C. Stefanosky	__	__ Inorganic: Perrone
__	X Project Mgr: CN. JOS	__	__ GC/LC: Rycklak/Schnell
__	X Section Mgr: Siery/Wesson/Daniels	__	__ MS: LeMin/Taylor/Kasdras
__	X QA (file): Racioppi	__	__ Log-in: Toder
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Schnell/Doughty/Kauffman	__	__ Other: _____

04R-1 Login 1/1/98

Review Comment Record (RCR)

1. Date	2. Review No.
2/16/99	BHI/QA99003
3. Project	**4. Page**
11607-D2	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H0324-RLN (SDG No. H0324)	100-DC Areas – Full Protocol – Waste Site 1607-D2 Soil Samples	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Solicited Approval:

Organization Manager (Optional) — Date

18. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact — Date

Author/Originator

11. CLOSED

22 Feb '99 — Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	PCB: Pages 002 and 003 are out of order. Page 003 should be Page 002 and Page 003 should be Page 002.		Corrected ppc	
2	Semi-volatile: Page 016, Chain of Custody is the laboratory internal chain of custody this should be the BHI Samplers chain of custody.		Corrected ppc	
3				
4				

Post-it® Fax Note 7671 | Date 2/22/99 | # of pages ▶ 3

To Jeanette Duncan | From Claude Stacey

Co./Dept. | Co.

Phone # 375-9479 | Phone # 372-9208

Fax # 372-9487 | Fax #

Review Comment Record (RCR)

1. Date	2. Review No.
2/16/99	BHI/QA99003
3. Project	4. Page
11607-D2	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H0324–RLN (SDG No. H0324)	100-DC Areas – Full Protocol – Waste Site 1607-D2 Soil Samples	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional) _____ Date _____

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact _____ Date _____

Author/Originator _____

11. CLOSED

Reviewer/Point of Contact _____ Date _____

Author/Originator _____

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	PCB: Pages 002 and 003 are out of order. Page 003 should be Page 002 and Page 003 should be Page 002.			
2	Semi-volatile: Page 016, Chain of Custody is the laboratory internal chain of custody this should be the BHI Samplers chain of custody.			
3				
4				

Jean Marshall
BHI Sample Management
Phone: (509) 372-9346
FAX: (509) 372-9487

facsimile transmittal

To: Claude Stacey Fax: 372-9447

From: Jeanette Duncan Date: 2/16

Re: Validation - Pg Missing PCBs Pages: 2

CC:

❑ Quick Turn / Priority Data ❑ Final Data Package

Claude –

Here's the missing PCB page –

Jeanette

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

Holding times were met for all samples.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

Equipment Blanks

One equipment blank (B0T6P1) was submitted for analysis. No analytes were detected in the equipment blank although the detection limit for arochlor-1221 was above the target detection limit (TDL).

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be

TRANSMISSION RESULT REPORT (FEB 16 '99 09:56AM)

BHI S&D MANAGEMENT 509 372 9487

(AUTO)

THE FOLLOWING FILE(S) ERASED

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027	MEMORY TX		3729447	02/02	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

Jean Marshall
BHI Sample Management
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FAX: (509) 372-9487

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To: Claude Stacey Fax: 372-9447

From: Jeanette Duncan Date: 2/16

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